

HANFORD ENVIRONMENTAL RESTORATION PROJECT

SUBCONTRACT NO. 0100B-SC-G0010

EXHIBIT "D"

SCOPE OF WORK

HANFORD ENVIRONMENTAL RESTORATION PROJECT

SUBCONTRACT 0100B-MR-G0010

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***100-B/C AREA PROCESS EFFLUENT PIPELINES
REMEDIAL ACTION***

0100B-SW-G0010
Rev. 1

EXHIBIT "D"


SCOPE OF WORK

FOR

100-B/C AREA PROCESS EFFLUENT PIPELINES

REMEDIAL ACTION

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**SCOPE OF WORK
REMEDIAL ACTION FOR THE 100 B/C AREA
PROCESS EFFLUENT PIPELINES**

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EXHIBIT "D"
SCOPE OF WORK
REMEDIAL ACTION FOR THE 100 B/C AREA
PROCESS EFFLUENT PIPE

1.0 GENERAL

1.1 WORK SCOPE SUMMARY

This remedial action work scope is for the removal and disposal of process effluent pipelines and specified soil contamination areas located at the 100 B/C Area. This work scope includes the engineering services necessary to support preparation of Issued for Construction (IFC) design drawings, locate pipelines utilities and structures that may impact excavation activities, and plan and construct support facilities (e.g., laydown areas, decontamination and survey stations, and air monitors). In addition, this scope of work includes furnishing facilities, equipment, labor, materials, supplies, and tools necessary to excavate, demolish, stockpile (as necessary), size, load, and transport underground piping systems, debris, materials, structures, and contaminated soils. The scope also includes backfilling the excavations with uncontaminated soils. The SUBCONTRACTOR is also responsible for environmental compliance activities such as erosion and run-on/run-off control. The pipelines and contaminated areas are indicated and described in the Subcontract documents.

In general, the SUBCONTRACTOR's work scope includes the following:

Verify the location and remove underground piping, anchors, soils, and structures associated with pipelines and contaminated areas. SUBCONTRACTOR shall be responsible to locate and remove all process effluent piping exiting the 105-B and 105-C Reactor buildings, including any associated branch pipelines that may be contaminated. These pipelines include, but are not limited to, process effluent piping, process overflow piping, and waste condensate piping systems. The liquid effluent carried radioactive, inorganic, and organic contaminants. The inside surfaces of the pipelines are likely to be contaminated, and the potential for airborne contamination exists. Water encountered during excavation and materials handling of pipelines or laterals may be integrated into the soil matrix for disposal.

Pipeline and soil stockpiling is limited to areas approved by the CONTRACTOR. Stockpiles cannot be placed on remediated sites or in close proximity to the Columbia River.

Undocumented pipelines, debris, and structures may be encountered during remedial action activities. The undocumented pipelines, debris and structures exposed within the physical limits of the excavations shall be removed and containerized of as part of the base scope at no additional cost to the CONTRACTOR. The undocumented pipelines, debris, and structures that fall outside the physical limits of the excavation work zone may be removed at the direction of the CONTRACTOR.

Active utilities cross or are near the remediation areas in several locations. The SUBCONTRACTOR is responsible for obtaining and reviewing Hanford Area drawings to verify any potential interferences. SUBCONTRACTOR shall propose design modifications to the interfering utilities as necessary. Prior to commencing excavation activities, the SUBCONTRACTOR is required to submit a plan for minimizing impacts to any active utilities. All proposed service modifications will be submitted to the CONTRACTOR for evaluation and acceptance prior to the SUBCONTRACTOR beginning construction.

The SUBCONTRACTOR shall notify the CONTRACTOR of work in the area of active utilities no less than seventy-two (72) hours in advance for coordination efforts with the Hanford Site utilities group. The 72-hours plus the time to shut down, design an alternate approach, protect in-place, and re-route or reconfigure the utilities shall be considered a part of this scope and no adjustment will be made to SUBCONTRACTOR.

Specific work scope includes:

- Perform activities to remove, cut within specified limits, stockpile and/or containerize¹ for disposal underground steel, vitrified clay, asbestos cement, cast iron, and reinforced-concrete piping systems and/or other pipelines shown on project drawings. The excavation also includes all associated soils 12 in. beneath the base of the pipes and structures. This includes work necessary to provide personnel access and general support of the CONTRACTOR'S waste characterization, and various field survey activities.
- Perform activities to remove, stockpile and/or containerize¹ (as necessary) for disposal interfering above-and below-grade contaminated/uncontaminated steel, reinforced-concrete structural materials, and miscellaneous debris.
- Perform activities to remove, stockpile, and/or containerize¹ (as necessary) contaminated and uncontaminated soils in accordance with the Subcontract documents.
- Perform activities to remove and containerize¹ for disposal asbestos-containing material as required by the Subcontract documents. Provide and maintain relevant and appropriate asbestos training and medical baseline requirements for SUBCONTRACTOR staff performing asbestos work.
- Perform environmental compliance activities including applying dust suppressants, minimizing fumes from pipe cutting, and controlling erosion and run-on/run-off in accordance with the Subcontract documents.
- Perform activities to remove and store Washington State dangerous waste (e.g., lead and lead-containing material), as required by the Subcontract documents. Provide and maintain relevant and appropriate dangerous waste training and medical baseline requirements for SUBCONTRACTOR staff performing dangerous waste-related work.

¹ Containers provided by others.

- Perform activities to transport containers to and from the Container Transfer Facility and the excavation areas, and stage the containers for disposal. Transportation of containers from Container Transfer Facility to Environmental Restoration Disposal Facility (ERDF) will be performed by others.
- Perform activities to backfill, compact, and establish final grade following pipeline removal and cleanup verification.
- Perform activities to decontaminate equipment.

The SUBCONTRACTOR has the responsibility to ensure that work is planned and the site is configured to accommodate potential interferences defined within the given scope of work. The SUBCONTRACTOR shall consider constraints inherent to a radiological work environment when planning and executing the work. The SUBCONTRACTOR shall use appropriate personnel protection equipment (Level D, C, and B per 29 CFR 1910) for this scope of work.

1.2 ABBREVIATIONS AND ACRONYMS

ACM	asbestos-containing material
Anti-Cs	anti-contamination clothing
CAD	computer-aided drafting
CFR	<i>Code of Federal Regulations</i>
dpm	disintegrations per minute
ERDF	Environmental Restoration Disposal Facility
HASP	health and safety plan
HGET	Hanford General Employee Training
ICF	Issued for Construction
MAQDSR	Monthly Air Quality Data Summary Record
OSHA	Occupational Safety and Health Administration
PPE	personal protective equipment
RCT	radiological control technician
RL	U.S. Department of Energy, Richland Operations Office
RPPM	Radiation Protection Program Manual
WAC	<i>Washington Administrative Code</i>

2.0 WORK INCLUDED

The work includes furnishing all labor, supervision, materials, equipment², container liners, tools, facilities, supplies and necessary articles, and performance of all operations and

² Except for waste disposal containers.

incidentals for excavation, removal, handling, containerization, associated transportation³, stockpiling (i.e., of uncontaminated materials and materials requiring treatment), and backfilling in accordance with the Subcontract documents.

The work includes, but is not limited to, the following:

- Design
- Mobilization
- Excavation, demolition, and material handling
- Backfill
- Demobilization.

2.1 DESIGN

Perform design work, at a minimum, for the following functions and facilities:

- Pipe/soil removal, stockpiling as necessary, and containerization
- Erosion protection and run-on/run-off control
- Survey and decontamination station(s)
- Container Transfer Facilities (Note: Two inactive container transfer facilities are available for SUBCONTRACTOR's improvement and use.)
- Haul/construction roads and areas to stockpile soils and materials
- Traffic planning and control
- Existing utility protection and re-route (if necessary)
- Power line, power pole, guy wire, and anchor protection. If power pole relocation is necessary, redesign the affected spans of power line and hardware to comply with applicable utility design criteria and accommodate the power pole relocation.
- Electrical power distribution from transformers or generators to SUBCONTRACTOR's survey stations, satellite offices, and facilities
- Water fill station(s) and/or fill capabilities as necessary.

³ Transportation of filled containers from Container Transfer Facility to disposal facility will be provided by others.

Design work shall include, but is not limited to, the following:

- Preparation of IFC drawings for the above items using SUBCONTRACTOR-obtained and generated topographic base maps. All IFC drawings shall contain a SUBCONTRACTOR-generated title/revision box and shall be stamped by a Professional Engineer registered in the State of Washington. The design drawing submittals required from the SUBCONTRACTOR shall include:
 - Comprehensive pre-excavation topographic plans for the entire work area depicting the following:
 1. Pre-excavation topography extending laterally 30.5 m (100 ft) beyond the limits of planned subcontractor excavation, stockpile, and work areas
 2. Pipeline and related structure, utility, and relevant interference locations and orientation
 3. Pipeline stationing every 50 m (164 ft).
 - Profile drawings for each pipeline depicting the following:
 1. Line showing pre-excavation topography
 2. Line showing datum 4.57 m (15 ft) below the pre-excavation ground surface
 3. Pipeline and related structure base elevations
 4. Utility and structure interference, location, orientation, and relevant elevations
 5. Pipeline stationing every 50 m (164 ft).
- Preparation of detailed plans, as applicable, describing work activities associated with the performance of this Subcontract. Plans affecting worker safety shall be approved and stamped by a Professional Engineer registered in the State of Washington.
- Performance and preparation of design calculations. Calculations affecting worker safety shall be approved and stamped by a Professional Engineer registered in the State of Washington.

All facilities and infrastructure necessary to support this Subcontract shall be designed and sited to minimize or avoid impacts to cultural and natural resources. The SUBCONTRACTOR shall use previously disturbed areas to the fullest extent possible for all support facilities, roads, and stockpile areas.

2.2 MOBILIZATION

2.2.1 Training and Medical Requirements

The SUBCONTRACTOR safety and health program shall provide specific instructions for the SUBCONTRACTOR personnel in areas where there are CONTRACTOR and regulatory requirements. The SUBCONTRACTOR's health and safety program shall be uniform/consistent with the CONTRACTOR'S other nearby operations and/or operations of other site subcontractors.

The SUBCONTRACTOR must demonstrate through properly documented records that personnel performing work onsite have completed the appropriate training and medical requirements prior to commencement of work. Records shall be maintained by SUBCONTRACTOR and available onsite for CONTRACTOR review.

SUBCONTRACTOR site personnel must attend site-specific training to be furnished by the CONTRACTOR. Note that the site-specific training shall be U.S Department of Energy, Richland Operations Office (RL)-approved to be considered valid.

Personnel who have the potential to enter or create a dangerous waste, hazardous substance, radiological area must be in compliance with the training requirements specified in 29 CFR 1910.120 and 10 CFR 835. Work performed outside of hazardous or radiological areas may require additional training. Site-specific training and/or training applicable to specific tasks specified in the SUBCONTRACTOR's health and safety plan (HASP) may be required. Supervisors of hazardous waste workers require 40-Hour Hazardous Waste Worker Training and 8-Hour Supervisor Training regardless if they enter a posted hazardous area or not.

Certified training for handling asbestos- and/or lead-containing material is required for personnel involved with removing, containerizing, and packaging of asbestos-and/or lead-containing material.

Hanford General Employee Training (HGET) is required by all employees working on the Hanford Site. Advance notice of one (1) week is required for this training. Maximum seating for HGET training classes is five people per day. Advance notice is required for radiological whole body counts.

2.2.2 Mobilization and Set-Up

Mobilization shall include delivery of equipment, tools, materials, supplies, facilities, setup, and sufficient work force required to perform the work specified in this Subcontract.

The SUBCONTRACTOR shall provide the CONTRACTOR, before delivery, a list of all equipment to be used onsite. The SUBCONTRACTOR shall update the equipment list when additional equipment is brought on or removed from the site. SUBCONTRACTOR shall submit certification that equipment delivered to the site is Occupational Safety and Health

Administration (OSHA)-compliant and uncontaminated. Equipment brought to the site shall be in good working condition and free of any residual dirt, oil, or grease. Equipment glass shall be free of cracks. All toxic or hazardous chemicals, regardless of quantity, shall be reported in accordance with the requirements of the "Hazard Communication Program," described in the Subcontract documents.

The SUBCONTRACTOR shall present equipment to be used in radiological areas to the CONTRACTOR for an initial radiological survey prior to use.

The SUBCONTRACTOR shall submit a chemical management plan for CONTRACTOR review in accordance with the Chemical Management Program requirements described in the Subcontract documents.

The SUBCONTRACTOR shall submit proposed area(s) for delivery and staging of equipment as part of site layout plan shop drawing. The SUBCONTRACTOR is responsible for site preparation (i.e., stripping of vegetation, leveling, and security/access control requirements).

The CONTRACTOR reserves the right to inspect equipment and its setup for safe operation at any time. The SUBCONTRACTOR shall correct any safety deficiency prior to operation and throughout the duration of the project.

2.2.3 SUBCONTRACTOR-Provided Support Facilities

Before commencement of remedial action operations, the SUBCONTRACTOR shall furnish and establish all stations, roads, facilities, and storage areas necessary to conduct the 100 B/C Pipeline Scope of Work. This includes all access roads and other support infrastructure, including, but not limited to the following:

- Survey and decontamination station(s)
- Container Transfer Facility(s) (Note: Two inactive container transfer facilities are available for SUBCONTRACTOR's improvement and use.)
- Haul/construction roads and storage areas for soils and materials
- Portable toilets in accordance with applicable OSHA regulations (separate for men and women)
- Change and personal protective equipment (PPE) storage trailer
- Radiological control technician (RCT) office/lunch trailer

- Task lighting of transfer queue during off-hours (as needed) and winter months (October through March)
- Water fill station(s) and/or fill capabilities, as necessary
- Drinking and wash water facilities (e.g., table, cups, dispenser, liquid soap and dispenser, debris and refuse containers, and towels) for all site workers and SUBCONTRACTOR-provided facilities.
- Electrical power for portable equipment such as air monitors and radiological screening equipment.

Upon delivery, the SUBCONTRACTOR shall make all field service connections to SUBCONTRACTOR-supplied facilities. The CONTRACTOR reserves the right to inspect the facilities at any time. The SUBCONTRACTOR shall correct any deficiencies to facilities throughout the duration of the project.

The SUBCONTRACTOR shall supply facilities (e.g., office, changing facilities, and septic/portable toilets) for their personnel and RCTs and make all field service connections to the facilities. SUBCONTRACTOR shall submit verification that factory-built structures comply with *Washington Administrative Code* (WAC) 296-150F and that commercial coaches comply with WAC 296-150C. Factory-built structures and commercial coaches shall meet tie-down requirements from applied wind loads and shall be skirted. Septic holding tanks (if necessary) shall meet the requirements of WAC 246-272. Roll-away septic holding tanks are considered an approved equal. The SUBCONTRACTOR is responsible for acquiring required permits for the septic system.

2.2.4 Work Zone Delineation and Traffic Control

The SUBCONTRACTOR shall supply all material (e.g., yellow and magenta rope, and posts), equipment, and personnel required for the demarcation and maintenance of all construction and radiological control zones/areas, as described herein and in Subcontract documents. The CONTRACTOR will provide radiation control posting (i.e., signs and labels) for SUBCONTRACTOR installation.

The SUBCONTRACTOR shall post and maintain all radiological work areas in accordance with the Subcontract documents and as directed by the CONTRACTOR, to maintain an adequate level of radiological control. When transferred from a radiological work area to a nonradiologically controlled area, all equipment and personnel will be subject to survey (and possible decontamination) to the extent appropriate, as determined by the CONTRACTOR, based on radiological conditions and the extent of radiological control.

Not all soils have been characterized to meet release criteria/standards. The SUBCONTRACTOR shall anticipate delays in work performance consistent with the nature of radiological work environments. Delays inherent to excavation and removal include

analytical sampling and radiological surveying (frequency specific to area) of all newly exposed surfaces (uncontaminated or contaminated). Coordination between the SUBCONTRACTOR and CONTRACTOR will be required to minimize/eliminate the impact of analytical sampling and radiological surveying activities on remediation operations.

The work area currently exists within a radiologically controlled area (e.g., reactor site area). Most of the areas to be excavated are currently posted as "underground radioactive material areas." Some areas are posted as "soil contamination areas" and others are posted as a "contamination areas." Radiological posting and work zone delineation requirements are described in 10 *Code of Federal Regulations* (CFR) 835 and in the CONTRACTOR's Radiation Protection Program Manual (RPPM).

Areas or materials designated by the CONTRACTOR as "uncontaminated" may require radiological posting prior to verification of contaminant levels below the cleanup levels.

The SUBCONTRACTOR shall prepare and submit a traffic/access control plan for CONTRACTOR review describing how traffic and personnel will be directed, including speed limits, flow patterns and signage, to facilitate cleanup efforts and avoid accidents. The plan shall also describe how the SUBCONTRACTOR will maintain access control (allowing only authorized personnel into site boundaries), where fencing (permanent or temporary) and gates will be installed, when gates will be locked, and how gates will be controlled when unlocked. Traffic corridors shall be identified in accordance with the approved SUBCONTRACTOR traffic/access control plan. SUBCONTRACTOR shall provide, install, and maintain signs, and access control gates in accordance with the traffic/access control plan. SUBCONTRACTOR shall install any additional signs as directed by CONTRACTOR.

2.2.5 Air Monitoring and Dust Control Requirements

The SUBCONTRACTOR shall set up a maximum of five (5) CONTRACTOR-supplied portable air monitors at locations shown on the project drawings. Air monitors must have the following operational power requirements: 110 VAC, 60Hz, and 5.1 amps. The locations and operations of air monitors shall be coordinated with the CONTRACTOR and shall be operational two (2) weeks prior to start of excavation activities. The SUBCONTRACTOR shall either design, supply, install, and maintain electrical service from existing electrical service distribution systems, or supply, maintain, and operate portable electrical generators with a minimum fuel capacity of seventy-two (72) hours to power the air monitors continuously at no additional cost to the CONTRACTOR.

SUBCONTRACTOR shall inspect these monitors until excavations are complete, the soil (exposed surfaces) has been stabilized, and regulator approval for monitor shutdown is received. The inspection of air monitors shall be coordinated with the CONTRACTOR. Air monitors must be operational 24 hours a day, including weekends and holidays. The SUBCONTRACTOR shall inspect the air monitors daily, except on non-working holidays and weekends, to ensure that the monitors are operating and shall record the status on a Monthly Air Quality Data Summary Record (MAQDSR) and submit to the CONTRACTOR

every month. Any interruption of operation and resulting action taken shall be recorded on the MAQDSR, and the CONTRACTOR shall be immediately notified.

Air monitor downtime will be minimized. If an air monitoring station is out of operation for more than 48 hours during normal work operations (excluding weekends and holidays), the regulatory agencies will be notified. If two or more stations are out of operation for greater than 48 hours during normal work operations, excavation and loading activities shall be temporarily suspended until operation of at least three stations are restored or backup equipment is deployed. The Environmental Lead will determine which air monitors are required to be operating. This determination will be made based on location of current and near-future excavation activities, meeting minutes, and regulatory requirements.

No visible dust is allowed. The SUBCONTRACTOR shall apply a fixative to open excavation surfaces when not active for more than 24 hours, when sustained overnight wind speed is predicted to be greater than 8.9 m/s (20 mph), by the Hanford Weather Station forecast (available at 8:00 a.m. daily), or when excavation operations are suspended because of high winds. The SUBCONTRACTOR is responsible to furnish and apply the fixative.

2.2.6 Readiness Assessment

Prior to Notice to Proceed, the SUBCONTRACTOR shall demonstrate to the CONTRACTOR that its personnel, procedures, and equipment are ready to commence work as defined in this Subcontract. Any deficiencies noted during this readiness assessment must be corrected before the CONTRACTOR will issue the Notice to Proceed.

2.3 EXCAVATION, DEMOLITION, AND MATERIAL HANDLING

For all work described herein, the SUBCONTRACTOR shall anticipate delays consistent with the nature of performing this work in a radiological environment. For example, atmospheric conditions (e.g., fog) may impact work due to radon gas, or high winds may delay work due to visible dust. All excavation and material handling shall be performed in accordance with the following descriptions.

2.3.1 General

CONTRACTOR approval and Notice to Proceed shall be required prior to excavation and pipeline removal. Radiological support, provided by others, is required for all subsurface work, whether known contamination exists or not.

The SUBCONTRACTOR shall remove all structures and interferences, such as concrete junction boxes, during the same time that the surrounding soil and adjoining pipeline connections are removed. Soil shall be removed to a depth of 0.305 m (1 ft) below the base of the pipe or structure being removed. Excavation activities are completed when the CONTRACTOR agrees that the limits of the excavation (as defined in the Subcontract documents) have been reached and there are no visible signs of the engineered structure

remaining (e.g., concrete, steel, rust and pipe scale, wood, or asbestos). It is not acceptable for the removal of structures and other interferences to be deferred to the end of the project.

Stripping of the site areas shall be the responsibility of the SUBCONTRACTOR within the boundaries identified in the Subcontract documents. Other areas may require stripping, as directed by the CONTRACTOR. Uncontaminated soil and organic materials collected as part of the stripping operation shall be stockpiled separately for later use as topsoil over backfilled material.

The SUBCONTRACTOR shall excavate and stockpile uncontaminated overburden and remove, load, and transport materials including, but not limited to, soil, lead-containing materials, reinforced-concrete and steel structures, cast iron, steel, vitrified clay, asbestos cement, asbestos, and reinforced-concrete pipelines. Certified training for handling asbestos- and/or lead-containing material is required for personnel involved with removal, containerization, and packaging of asbestos- and/or lead-containing material.

Contaminated soil within the pipeline corridor shall be determined in the field by the CONTRACTOR. Contaminated soil will be determined with analytical sampling and in-progress radiological surveying (frequency specific to area) of newly exposed surfaces (contaminated and uncontaminated).

The SUBCONTRACTOR shall excavate in accordance with the requirements of 29 CFR 1926, Subpart P. Safe access shall be provided for excavation operations including pipe cutting and pipe removal (i.e., pipe joint cutting), sampling efforts, radiological monitoring/surveying, and civil surveying.

It is expected that actual contamination area and/or site pipeline orientation and locations may vary from the boundaries shown on the project drawings. Therefore, the CONTRACTOR reserves the right to alter the shape of any excavation. The SUBCONTRACTOR shall excavate to revised limits, as directed by the CONTRACTOR, should the CONTRACTOR choose to exercise this right. This work shall be considered to be part of the original Subcontract scope of work. No cost or schedule compensation will be made for SUBCONTRACTOR's inadvertent and/or unauthorized excavation beyond the specified excavation limits.

Following the excavation and before backfilling operations, the SUBCONTRACTOR shall secure access to open excavations by placing adequate physical barriers across any unsecured access points. Excavations may remain open for an extended period of time pending approval to backfill. For this scope of work, the SUBCONTRACTOR shall excavate as shown on the project drawings for uncontaminated and contaminated materials unless directed otherwise by the CONTRACTOR. Excavation safety and access may require the SUBCONTRACTOR to develop ramps for personnel access and/or excavate flatter slopes than shown or implied on the project drawings. No additional compensations will be made for access ramps and flattening of slopes for safety.

Uncontaminated materials are typically materials requiring excavation or handling to allow access to contaminated materials. The CONTRACTOR will identify uncontaminated materials by field screening methods and general field observations during excavation by the SUBCONTRACTOR. The SUBCONTRACTOR shall excavate identified uncontaminated materials and selectively stockpile at location(s) determined in the field and approved by the CONTRACTOR for further testing and evaluation by the CONTRACTOR. Upon completion of CONTRACTOR's testing and evaluation, the SUBCONTRACTOR shall use CONTRACTOR-verified uncontaminated material as clean backfill or load for shipment to ERDF if the material is not verified to be clean. The SUBCONTRACTOR will not receive additional compensation for double-handling if material initially designated as uncontaminated is later designated as contaminated.

Contaminated materials have contaminant concentrations above the cleanup levels and require excavation, handling (including stockpiling as determined by the SUBCONTRACTOR), and packaging for transportation to ERDF. The CONTRACTOR will identify contaminated materials by field screening methods and general field observations during excavation by the SUBCONTRACTOR. Stockpiling of contaminated materials, at the SUBCONTRACTOR's discretion, prior to packaging for transportation to ERDF shall be at CONTRACTOR-designated location(s).

Double-handling of contaminated soil due to poor SUBCONTRACTOR work control and housekeeping practices will be performed at the SUBCONTRACTOR's expense.

SUBCONTRACTOR shall be responsible for removal of contaminated soil that requires treatment or special handling (e.g., hazardous or dangerous waste), as directed by the CONTRACTOR, from stockpiles to a designated contaminated stockpile, and later loading and packaging for transport to ERDF.

2.3.2 Pipeline Excavation, Demolition, and Removal

2.3.2.1 Physical Limits of Pipeline Work

The physical limits of the pipeline-related excavation, demolition, and removal work are as follows:

- Required depth of excavation is 0.305 m (1 ft) beneath the lowest point of all pipelines, concrete, and other engineered structures.
- Side slopes of 1.5 horizontal to 1 vertical (1.5:1).
- Base width of trench to be determined by SUBCONTRACTOR to allow safe access for project personnel. A minimum excavation base width of 1 m (3.28 ft) laterally beyond the plan-view extent of the pipeline or structure is required.

The SUBCONTRACTOR shall excavate, demolish, load, and transport all contaminated and uncontaminated soil, debris, documented and undocumented structures and pipeline, and effluent pipelines and related concrete structures that are located within the physical limits described above. The SUBCONTRACTOR is responsible for the safety of the work area. If the SUBCONTRACTOR chooses to excavate to a more gradual slope (e.g., 2:1) (for whatever reason), all work will be considered to be part of the baseline scope with no additional compensation, even if additional contaminated material is encountered due to the more gradual slope.

2.3.2.2 Pipeline Excavation Proximity Sites

Proximity sites are waste sites that are in or adjacent to pipeline work areas. No additional compensation will be made for proximity site work. The SUBCONTRACTOR's unit prices for pipelines shall include the proximity site work described below.

Several proximity sites are to be removed in their entirety if encountered during pipeline remedial action. These sites are identified as follows:

- 118-B-2. Construction burial ground used for disposal of solid waste generated by modifications to the effluent lines and other reactor modifications. Site is approximately 8.29 m (60 ft) long, 9.14 m (30 ft) wide, and 4.57 m (15 ft) deep.
- 100-B-5. Effluent vent disposal trench located east of 105-B Reactor between the two 66-in. steel pipelines leading from 105-C Reactor. The 30.48-m (100-ft)-long, 3.05-m (10-ft)-wide, by 4.57-m (15-ft)-deep trench was used to collect leakage from the cross connection box shown on the project drawings.
- 118-B-7. Solid waste burial ground used for disposal of small amounts of waste from the 111-B fuel inspection station. The 2.44-m (8-ft)-long by 2.44-m (8-ft)-wide by 2.44-m (8-ft)-deep site also received decontamination materials and assorted equipment from that station. Small amounts of reactor hardware may have also been placed in this site. The actual location of this site is unknown; therefore, the site may or may not be encountered during pipeline remedial action.

Several other proximity sites may be encountered during pipeline remedial action. Only the portions of the sites that fall within the physical limits (described in the previous section) will be removed and handled by the SUBCONTRACTOR. These sites are identified as follows:

- 118-B-10. Ball 3X storage vault (metal tank).
- 132-C-1. The reactor exhaust stack burial area contains rubble from the 105-C Reactor stack.

2.3.2.3 Excavation in Proximity to the 105-C and 105-B Reactor Buildings

SUBCONTRACTOR shall provide all necessary engineering services, equipment, shoring, and sloping to preserve and protect the structural integrity of the 105-B and 105-C Reactor facilities and other buildings while working near reactor buildings. Materials excavated from within the 105-B and 105-C Reactor perimeter fences shall not be stockpiled within the reactor areas as defined by the perimeter security fence, unless authorized by the CONTRACTOR.

The SUBCONTRACTOR shall remove all piping and conduits to within 1.5 m (5 ft) of the 105-C reactor building. For the 105-B reactor, the SUBCONTRACTOR shall remove all piping and related structures such that no ground disturbance occurs within 7.6 m (25 ft) of the reactor buildings. Given the side slope limitation of 1.5 horizontal to 1.0 vertical, the actual location of the pipe cut will be greater than 7.6 m (25 ft) from the buildings. The pipelines entering the buildings shall be capped or blocked to protect workers and prevent entrance to the pipes. Nominal DN300 (12-in.) pipes and smaller shall be sealed with grout or crushed shut if feasible. Pipes greater than DN300 (12 in.) shall be capped by first wrapping and taping with 10-mil reinforced polypropylene bags or sheets and then boxing the end with 19 mm (0.75-in.) exterior-grade plywood as necessary for protection from backfill materials.

2.3.2.4 Handling Pipeline Asbestos Materials

The SUBCONTRACTOR shall provide an asbestos abatement plan in accordance with 40 CFR 61.140 through 157. Asbestos-containing material (ACM) shall be packaged in compliance with ERDF waste acceptance criteria. The asbestos shall be handled and bagged, containerized separately, and staged for shipment to ERDF. The SUBCONTRACTOR shall be responsible for appropriate training and compliance with all technical and engineering/administrative controls in accordance with the strictest governing requirements.

Asbestos cement pipe (4-in.) is identified on the project drawings. Portions of the existing underground carbon steel pipe, DN1500 (60-in.) diameter and larger, is coated with coal tar epoxy and lagged with asbestos felt material (up to 30% chrysotile) asbestos.

Remediation of coated pipelines with ACM shall be performed in the following manner:

- Segment (circumference cut) long sections in the ground (30- to 50-ft lengths) for initial pick from trenches or for ease in working in trenches. This can be accomplished by either (1) manually abating a small strip of asbestos for torch (circumference) cutting, or (2) performing the circumference cut in the trench by use of trackhoe-mounted mechanical shears. The remaining ACM on the pipes may be left in place during the pipe-sizing operation.
- If torch cutting is used for circumference cuts, the asbestos on the pipe near the torch cut shall be manually removed/abated and packaged separately according to the Subcontract documents.

- SUBCONTRACTOR shall move sections to a CONTRACTOR-approved asbestos staging area, and/or top of trench, with a trackhoe-mounted grappling device.
- At designated asbestos staging area or in the trench, further segment the pipe lengths according to the waste-sizing requirements in the Subcontract documents (i.e., 3.05-m [10-ft] lengths [circumference cuts] and one-third longitudinal [longitudinal cuts]). Pipe sizing to meet waste disposal size requirements shall be performed by mechanical means (e.g., trackhoe-mounted shear).
- The SUBCONTRACTOR shall provide continuous dust control measures (i.e., water misting) during all phases of ACM-related work
- All ACM material must be containerized according to the Subcontract documents by the end of each work day
- Fixative shall be applied to any sections of reduced pipe and ACM that remain exposed and cannot be loaded out by the end of the day.
- Visible large pieces of ACM that fall off the pipe shall be manually removed and packaged separately. Smaller pieces of residual ACM from the pipe removal process will remain in place in the trench and will continue to be wetted or sprayed with water until (1) the trench is backfilled, (2) a fixative or binding agent is applied, or (3) the material is excavated as part of any necessary clean up of non-ACM soil contamination.

The SUBCONTRACTOR shall not use the excavator bucket to scrape off soil from the pipelines, as it may cause ACM to fall off when loading potentially clean material. Other less abrasive means must be used to remove the soil from the pipelines when loading potentially clean material.

- The segmented pipes (with asbestos lagging still on it), shall be placed in double-lined/sealed (minimum 6-mil plastic sheeting) transport containers and shipped to ERDF for disposal
- All SUBCONTRACTOR employees working on ACM-related tasks shall be trained in accordance with OSHA regulations.
- All ACM work will be performed under the direct supervision of the SUBCONTRACTOR's Certified Asbestos Supervisor/Competent Person.

The SUBCONTRACTOR is responsible for all monitoring and posting requirements. Clearance sampling (air sampling) associated with pipe abatement is not required. Visual inspection will support ACM downposting.

Material not containing ACM is not required to be removed or treated separately. Asphaltic mastic residue with no ACM may remain on the pipes.

2.3.2.5 Plastic Vent Pipe

The plastic vent pipe is located east of the 105-C Reactor building. Elevated alpha, beta, and gamma radiation were detected during previous remedial actions when this pipeline was excavated. The SUBCONTRACTOR shall perform this work separately from other tasks. The unique requirements for this work (i.e., may require additional time and SUBCONTRACTOR resources) include, but are not limited to, the following:

- Additional radiological controls such as continuous dust suppression activities
- Work under a separate radiological work plan
- Double-lined containers for transport
- Work areas covered with clean soil at the end of each work day
- Limits on the amount of pipeline segments per container and bedding pipeline segments in soil
- More frequent radiological surveys and analytical sampling.

Contaminated and uncontaminated debris may be encountered where the plastic vent pipe crosses the 132-C-1 site. The removal, handling, and disposal of this material are part of the plastic vent pipe work scope.

2.3.2.6 Undocumented Pipe and Debris

Undocumented pipe, conduits, and debris may be encountered during excavation work. Materials encountered within the physical limits (as described in Section 2.3.2.1) will be excavated and handled in the same manner as documented pipelines with no additional compensation.

If the undocumented pipelines extend beyond the physical limits (per Section 2.3.2.1), the CONTRACTOR may exercise the option to pursue the pipelines beyond the physical limits.

2.3.3 Contaminated Soil Areas, Contaminated Soil Stockpiles, and Contaminated Pipeline Soils

2.3.3.1 Contaminated Soil Areas

Contaminated soil areas identified on the project drawings represent soils to be excavated, loaded, transported, packaged, and disposed at ERDF. These areas represent in-place

contaminated soil (i.e., not stockpiled); excavation of these soils will be required. Three of these areas are shown on the project drawings.

2.3.3.2 Contaminated Soil Stockpiles

Contaminated soil stockpiles identified on the project drawings represent stockpiled soils to be loaded, transported, packaged, and disposed at ERDF. These soils differ from the contaminated soil areas in that the material is present in stockpiles, do not require excavation, and can be loaded directly (provided that access roads are available). Six of these stockpiles are shown on the project drawings.

2.3.3.3 Contaminated Pipeline Soils

The designated contaminated pipeline soil extends laterally beyond the anticipated physical limits of excavation required for pipeline removal. Excavation of this soil is required during the pipeline work. Two areas of this type are identified on the project drawings. These designated contaminated soil areas are considered to be part of the pipeline work scope.

The first area is located near the 66-in. pipeline just south of the 132-B-6 Outfall Structure. The base area is approximately 1,770 m² (19,052 ft²) and shall be excavated to a maximum depth of 4.57 m (15 ft), unless directed otherwise by the CONTRACTOR.

The second area is located on the southern rim of the former 116-C-5 Retention Basin site where the 60-in. and 66-in. steel pipes fork to the northeast and feed the basin. The base area is approximately 534 m² (5,748 ft²) and shall be excavated to a maximum depth of 4.57 m (15 ft), unless directed otherwise by the CONTRACTOR.

2.3.4 Outfall Structure Excavation, Demolition, and Removal

Three outfall structures shall be demolished and removed by the SUBCONTRACTOR. All three outfall structures have been decommissioned by filling the outfall structures with concrete, debris, soil, or rocks (as indicated on the project drawings). The "as-built" decommissioned condition of 116-B-7 Outfall Structure is known. The 132-B-6 and 132-C-2 structures are assumed to be essentially in tact and filled with contaminated debris, soil, rocks, and concrete (as shown on the project drawings). The concrete structures are assumed to be contaminated similarly to the pipelines. The current contents of the structures may or may not be contaminated.

The outfall structures are located on the upper southern bank of the Columbia River. Because of the proximity to the river, the SUBCONTRACTOR shall comply with all state and Federal run-on/run-off and erosion control requirements. The SUBCONTRACTOR shall be responsible for providing all materials, means, and methods for complying with the requirements, including silt fences.

The excavation shall have slopes no steeper than 1.5:1 (horizontal:vertical). During remediation, the SUBCONTRACTOR shall cover the downstream pipelines with plywood to

protect workers, prevent entrance, and prevent debris from entering the pipeline. At the completion of the excavation work, the pipelines shall be permanently sealed.

The effluent pipes leading from the outfall structure to the river shall be plugged with a water-tight seal that can be removed at some future date. Reinforced-concrete pipes shall be sealed with grout or concrete. A preliminary plug constructed of plywood or rocks may be installed (if needed) to enable grout and concrete to set up. Steel pipe is to be sealed with 6-mm (0.25-in.)-thick (minimum) steel plate. The steel plate is to be installed with a continuous weld around the entire circumference of the pipe to prevent the intrusion of water or other materials into the pipe. The SUBCONTRACTOR shall submit a plan for plugging the pipes before performing the work. The open spillways do not require plugs.

The SUBCONTRACTOR shall backfill the outfall structure excavations in the same manner as described in Section 2.4; however, utility location tape shall be placed around the remaining structures (i.e., downstream pipelines and spillways) to assist in future location efforts. The tape shall be installed vertically from the remaining structures to within 0.5 m (1.64 ft) of the final grade, at which point, at least 1 m (3.28 ft) of tape will be placed horizontally in alignment with the flow direction to the river. Pipelines and spillways shall be marked separately.

2.3.5 Trenching and Potholing

SUBCONTRACTOR shall excavate potholes and trenches at CONTRACTOR's discretion during any phase of the project. In general, holes shall be backfilled when the effort is completed. Potholes and trenches will be excavated on an as-needed basis to define contaminated areas or obtain samples for waste profile development. The minimum width of a trench will be the width of the bucket, or 1 m (3.28 ft), whichever is greater. The minimum depth of trenching will be 4.57 m (15 ft). The minimum dimensions of the pothole shall be 3.05 m (10 ft) by 3.05 m (10 ft) wide, and 4.57 m (15 ft) deep.

Potholes or trenches shall be excavated in locations directed by CONTRACTOR with either a trackhoe or backhoe. The SUBCONTRACTOR shall work under the guidance of the CONTRACTOR to provide access to excavations for screening or sampling as conditions warrant. CONTRACTOR screening requirements can range from discrete bucket scan to a sample collected every few feet vertically.

Potholing and trenching performed at the SUBCONTRACTOR's discretion shall be considered part of the baseline scope and performed at no additional cost to the CONTRACTOR.

2.3.6 General Requirements, Constraints, and Issues

The following general requirements apply to all remedial action activities described in the Subcontract documents.

2.3.6.1 Civil Survey Requirements

The SUBCONTRACTOR shall survey the physical dimensions and topography at various times during the project. At a minimum, the following surveys shall be performed:

- Area surveys prior to excavation (including proposed stockpile areas)
- Area surveys at completion of every 300 m (984 linear ft) of pipeline excavation (including locations of exposed features such as foundations, large rock outcrops, stained soils, clean pipelines, and utilities)
- Stockpile area surveys at completion
- Area surveys at the completion of additional contaminated soil excavations and outfall structure excavations
- Borrow pit survey prior to beginning backfill
- Area surveys after placement of all backfill
- Borrow pit survey after all backfill has been placed.

The accuracy of survey points is the responsibility of the SUBCONTRACTOR. Locations and survey points/coordinates identified on the project drawings are for reference only. The SUBCONTRACTOR shall field verify and re-establish existing (or establish new) survey control points.

The SUBCONTRACTOR shall establish a temporary survey monument within 150 m (500 ft) of pipeline and contaminated soil excavation areas. Monuments shall be outside of the excavation zone, overburden staging areas, or haul routes, at locations approved by the CONTRACTOR.

An electronic file and paper copy of survey submittals shall be provided to the CONTRACTOR within ten (10) working days following completion of each of the surveys. The survey information shall be used by the SUBCONTRACTOR to develop base site maps. The SUBCONTRACTOR shall maintain site drawings and as-built drawings in accordance with the requirements of this Subcontract.

Civil survey drawing submittals shall be in accordance with the CONTRACTOR's engineering procedures: (1) "CADP-02, Drawing Format and Standards Guide," and (2) EDPI-4-46-01 "Project Drawings." When third-party civil engineering computer-aided drafting (CAD) software is used (e.g., AutoCad Land Development Desktop – LDD2), SUBCONTRACTOR shall submit all software project files developed for the submittal. These project files include, but are not limited to, point files, Coordinate Geometry (COGO) data, align data, digital terrain models (DTM), and earthwork data. These project files shall

accompany all civil survey drawing submittals. Due to the large file size, data shall be submitted on CD-R formatted compact disks. Each submitted disk shall be clearly marked by project name, phase of project, Bechtel Hanford, Inc. drawing number(s), and location description.

2.3.6.2 Housekeeping Requirements

The SUBCONTRACTOR shall perform housekeeping for all SUBCONTRACTOR-provided facilities to keep the site free of miscellaneous litter, trash, and debris. The SUBCONTRACTOR shall conduct routine daily cleaning required to keep the SUBCONTRACTOR-controlled/operated or occupied support facilities, site grounds, roads, waste sites, and pipeline trenches free of trash, litter, food, tumbleweeds, and dust. The SUBCONTRACTOR shall remove tumbleweeds from waste sites and pipeline trenches at the completion of excavation to allow CONTRACTOR sampling and analysis teams to verify that the site is clean.

The SUBCONTRACTOR shall provide an adequate supply of trash receptacles/dumpsters at the site and shall be responsible for verifying that appropriate material (nonhazardous, nonradioactive) is accumulated for SUBCONTRACTOR offsite disposal. Housekeeping shall also include, but is not limited to, providing supplies and materials for drinking water, toilet facilities, and wash stations.

2.3.6.3 Security at 105-B and 105-C Reactor Buildings

The 105-C Reactor building has been decommissioned and set up as an interim safe storage area. The termination point for the 100 B/C Pipeline Scope of Work is as shown on the project drawings.

The 105-B Reactor building is currently identified as a cultural/historical resource and the site of a future Hanford museum. The reactor and nearby infrastructure shall be preserved by the SUBCONTRACTOR.

Both reactors are surrounded by security fences. Access within the fenced reactor areas will require written authorization by the CONTRACTOR. The SUBCONTRACTOR is responsible to restrict access at all times from any person or persons being able to easily access the reactor buildings. SUBCONTRACTOR is responsible for providing temporary fencing at both reactor buildings and replacing the permanent perimeter fences when the work is completed. The temporary fencing shall be placed so the reactor building perimeter fence provides a continuous barrier. Security of the reactor buildings must be maintained during remedial action activities. Existing security fences may be removed for remedial action activities, but the areas must be secured by lock or guard when no activity is occurring.

The SUBCONTRACTOR shall reinstall security fences at the conclusion of activities. SUBCONTRACTOR use of existing security fence locking gates shall be coordinated with the CONTRACTOR.

2.3.6.4 Active Wells, Abandoned Wells, and Abandoned Borings

The project drawings show the locations of the relevant active wells, abandoned wells, and abandoned borings. The SUBCONTRACTOR shall protect the active wells during all phases of the project. All excavation and related activities shall be kept a minimum of 6.10 m (20 ft) from the well head at all times. If excavation is performed near the active wells, the side slopes of the excavation in the area shall be no steeper than 2 units horizontal to 1 unit vertical. If the SUBCONTRACTOR damages any well, the SUBCONTRACTOR must repair or replace the well at own expense.

Abandoned wells and borings are shown on the project drawings for information. The SUBCONTRACTOR can expect to encounter abandoned well casing, concrete seal material, and bentonite (clay) plug material in these locations. When encountered, these materials will be handled in accordance with the Subcontract documents with no additional compensation.

2.3.6.5 Above- and Below-Grade Interferences

All inactive interfering structures above- and below-grade and underground pipelines shall be cut into appropriate sizes, as defined in the Subcontract documents. Contaminated debris from interfering structure shall be loaded and transported to the Container Transfer Facility. Uncontaminated debris shall be loaded and transported to an alternate disposal area. These structures include, but are not limited to, underground pipelines, reinforced-concrete structures (e.g., boxes, anchors, supports, and encasements) associated with the piping systems, metal trusses, metal stairs, and miscellaneous metal sections stored on the ground. Radiological surveys will be made by CONTRACTOR to verify the status of the debris. Site walk-downs will be needed to confirm above-ground interferences.

The SUBCONTRACTOR shall be responsible for all services including labor, equipment, tools, and material required to protect or re-route active utility lines. The SUBCONTRACTOR shall coordinate any utility re-routing through CONTRACTOR.

2.3.6.6 Surface Drainage, Erosion, and Dust Control

The SUBCONTRACTOR shall develop a drainage plan for each excavation area, associated piping, spoil area, etc., as part of the earthwork plan. The plan shall describe how the SUBCONTRACTOR will meet all state and Federal dust control, surface drainage, and run-on/run-off requirements. Surface water shall be directed away from the excavation and construction sites to prevent ponding and erosion. Diversion ditches, dikes, and grading shall be provided and maintained during excavation activities to prevent erosion and sloughing of the slopes. The excavation shall be performed so the areas immediately surrounding the site and operations at the site are continually and effectively drained. The SUBCONTRACTOR shall also control erosion and prevent sediments and drainage from discharging to the Columbia River. SUBCONTRACTOR control of erosion, run-on, and run-off and compliance with regulatory requirements is critical for work on the outfall structures. Construction activities between the silt fence and the Columbia River are prohibited.

The SUBCONTRACTOR shall provide dust suppression to minimize the generation of visible dust emissions within the limits of the construction area throughout the duration of the Subcontract. No visible dust from the remediation work areas is allowed.

SUBCONTRACTOR shall control dust emissions using water, fixatives, crusting agents, or other methods/material acceptable to the CONTRACTOR. The SUBCONTRACTOR's earthwork plan submittal shall include a plan for controlling dust and shall specify the locations and equipment proposed for water fill stations.

2.3.6.7 Vehicular Access and Maintenance of Onsite and Offsite Haul Roads

The SUBCONTRACTOR shall provide excavation access ramps where required. The SUBCONTRACTOR shall also construct and maintain haul roads for the proper performance of this Subcontract. Road maintenance includes snow removal prior to the start of and as required during each work-day. Vehicular access to active area of the reactor area shall be maintained throughout the duration of the project. Snow removal shall be performed for the entire width of haul and access roads from the main road to the operation areas.

2.3.6.8 Contamination Control and Decontamination

The SUBCONTRACTOR shall excavate in a manner to minimize the potential spread of contamination and maintain dose as low as reasonably achievable. Any portion of equipment that comes into contact with contaminated material will not be permitted to make contact with uncontaminated material, equipment, or containers until all smearable contamination has been removed to less than 10 CFR 835, Appendix D levels. These levels are typically 1,000 disintegrations per minute (dpm)/100 cm² beta-gamma and 20 dpm/100 cm² alpha (transuranics). All decontamination work shall be performed in accordance with a SUBCONTRACTOR's set of decontamination work procedures, which will be reviewed by the CONTRACTOR before commencing work. The term "free of radiological contamination" includes the smearable limits (above) and less than 10 CFR 835, Appendix D total levels. These total levels are typically 5,000 dpm/100 cm² total (fixed and removable) beta-gamma and 100 dpm/100 cm² total (fixed and removable) alpha (transuranics).

The SUBCONTRACTOR shall provide equipment and personnel necessary to decontaminate equipment and materials to ensure that they are free of radiological contamination as described in the Subcontract documents. Decontamination fluids shall be collected and work shall be performed in accordance with the SUBCONTRACTOR's decontamination work procedures (part of the SUBCONTRACTOR's earthwork and excavated materials handling plan submittal), which will be reviewed by the CONTRACTOR prior to commencing work. SUBCONTRACTOR decontamination work procedures shall conform to "best management practices."

Any spread of contamination resulting from SUBCONTRACTOR's means and methods shall be remediated by the SUBCONTRACTOR at no additional cost to the CONTRACTOR.

2.3.6.9 Potential Subsurface Cultural Resources

Excavation activities will be taking place in areas of potential subsurface cultural resources. A CONTRACTOR Cultural Resources Specialist may be onsite and occasionally may need to examine excavations and/or excavated materials. The CONTRACTOR will coordinate this need to avoid impacts to the SUBCONTRACTOR production. The CONTRACTOR's Cultural Resources Specialist will provide an awareness briefing to SUBCONTRACTOR personnel. If any culture resources are encountered, work in the vicinity of the discovery shall be suspended and the CONTRACTOR's onsite representative shall be notified immediately. Should cultural resources be unearthed, excavation activities will be directed away from the immediate location of discovery while assessment and appropriate actions are taken by the CONTRACTOR.

2.3.6.10 Support of CONTRACTOR Field Screening, Surveying, and Sampling

In the process of excavation operations, the CONTRACTOR is required to systematically and intermittently conduct radiological surveys and sampling of the work and construction equipment for controlling contamination and ensuring worker health and safety. The CONTRACTOR will communicate this need to the SUBCONTRACTOR and, if necessary, direct the SUBCONTRACTOR to work away from the proposed survey and sampling area. Due to space constraints or the need to survey working equipment, it will sometimes be necessary to direct the SUBCONTRACTOR to suspend excavation and/or container-loading work during the radiological surveying or sampling operation. The SUBCONTRACTOR shall allow for work suspension of excavation and/or container loading beginning with the Notice to Proceed and continuing throughout the life of the project for non-routine radiological surveying. The SUBCONTRACTOR shall provide safe access for CONTRACTOR's sample technicians and RCTs to allow sampling and radiological surveys in accordance with OSHA requirements (29 CFR 1926). Unless prior approval is obtained from the CONTRACTOR, the SUBCONTRACTOR shall provide a minimum uniform slope no steeper than 1.5:1 (1.5 units horizontal per 1 unit vertical). If safe access is not possible due to steep or unstable side slopes, the SUBCONTRACTOR shall provide the proper equipment and operators to support safe access for workers.

SUBCONTRACTOR shall identify scheduled work activities that would require RCT involvement. SUBCONTRACTOR should anticipate rotations of RCT personnel at the site associated with a bargaining agreement and scheduled training. CONTRACTOR will coordinate with the SUBCONTRACTOR to provide a work force of RCTs to support the SUBCONTRACTOR's schedule and reasonable adjustments (weekly progress schedule update) to the SUBCONTRACTOR's scheduled work activities.

For several of the contaminated areas, it is anticipated that only minimal contamination is present; therefore, the amount of material requiring excavation is small. SUBCONTRACTOR's approach to such excavation shall be coordinated in advance with the CONTRACTOR to maximize sampling efficiency and minimize the amount of uncontaminated material excavated.

The SUBCONTRACTOR should anticipate delays and shutdowns due to environmental conditions such as high winds, atmospheric conditions that would create elevated levels of naturally occurring radionuclides (e.g., radon, which masks field instrument ability to detect radioactivity), and extreme cold.

Radiological and analytical field screening will also be performed by the CONTRACTOR after each 1-m lift is placed on designated clean stockpiles. SUBCONTRACTOR shall level stockpiles to provide a uniform surface for analytical screening equipment.

2.3.6.11 In-Process Waste Characterization Support Requirements

It is intended that characterization of the soils and other excavated materials will be carried out by the CONTRACTOR as the excavation progresses for purposes of waste characterization for disposal at ERDF and to evaluate whether environmental site cleanup goals are at or near attainment. The CONTRACTOR will make every effort to avoid impact to the SUBCONTRACTOR's production. The in-process waste characterization is separate from final site cleanup verification sampling and testing performed by the CONTRACTOR at completion of the contaminated area or pipeline excavation. The SUBCONTRACTOR shall allow soil sampling from the excavation, excavation equipment, excavated materials (containerized or not), and stockpiled material, as required, to obtain representative samples and/or field screening of the material.

2.3.6.12 Site Cleanup Verification Support Requirements

The SUBCONTRACTOR shall provide safe access for CONTRACTOR sample technicians and RCTs to allow sampling and radiological surveys for site cleanup verification purposes. The SUBCONTRACTOR shall allow soil sampling from the excavation, excavated materials (containerized or not), and stockpiled material, as required, to obtain representative samples of the material. Information from such sampling and surveying will be used by CONTRACTOR technical personnel for site cleanup verification purposes, to include verification of suspect uncontaminated stockpiled materials. The SUBCONTRACTOR's work sequencing shall be flexible to accommodate the CONTRACTOR's sampling activities.

2.3.7 Material Handling

All material removed from the excavation shall be segregated as uncontaminated, contaminated, contaminated potentially designated as dangerous waste, ACM, or septic waste (if encountered).

Material designated as uncontaminated shall be transported and temporarily stored by the SUBCONTRACTOR in the appropriate designated area. CONTRACTOR will perform confirmation sampling of these materials and verify that the materials are uncontaminated. Materials confirmed as uncontaminated will remain stockpiled until backfilling operations, at which time the uncontaminated soil shall be used as backfill. SUBCONTRACTOR is responsible for double-handling if a contaminated plume extends beyond contaminated area

or pipeline physical limits described in Section 2.3.2.1, and the stockpile has been placed over these extensions.

The SUBCONTRACTOR shall containerize and transport contaminated material to the Container Transfer Facility. The SUBCONTRACTOR shall keep equipment and personnel out of all former waste site areas that have been revegetated.

An estimated 0.5% of the contaminated volume is considered potentially dangerous waste and may require double-handling. Contaminated material potentially designated as dangerous waste shall be temporarily stored by the SUBCONTRACTOR within the area of contamination or appropriate separate designated areas set up and managed by the SUBCONTRACTOR in accordance with the requirements of WAC 173-303. Treatment is not included as part of this Subcontract.

Asbestos-containing material is known to exist as pipe wrap and gasket material at pipe joints. ACM may be encountered in other forms. The ACM shall be handled in accordance with an approved asbestos-handling plan.

SUBCONTRACTOR shall supply all labor, materials, equipment, and incidentals required for procurement, handling, sealing, and installing pre-formed plastic liners into ERDF containers.

2.3.8 Container Maintenance

The SUBCONTRACTOR is responsible for maintaining ERDF transport containers from time of delivery until receipt for pickup by others. Containers shall be protected and secured as necessary to prevent the intrusion of precipitation (i.e., water, ice, and snow). SUBCONTRACTOR shall identify and report to the CONTRACTOR any damage to containers that may affect containment of waste and report the damage.

The SUBCONTRACTOR is responsible for inspecting and dewatering containers (by pumping or the use of absorbent) with free-standing liquid in empty and full containers. Attention shall be directed to containers awaiting pickup during periods of and after inclement weather. Liquids found to be free-standing in containers (either full or empty) shall not be released for transport to ERDF and shall be considered contaminated (radioactive/chemical). Water shall be disposed as directed by the CONTRACTOR if absorbent material is not used. CONTRACTOR will direct the SUBCONTRACTOR to transfer water into containers (at the decontamination pad or container location) or to a waste site based on the circumstances and in accordance with approved SUBCONTRACTOR plans.

The SUBCONTRACTOR shall handle and furnish required maintenance on CONTRACTOR-supplied tarps installed on containers as follows:

- Inspection of and adjusting tie-down cords on tarps

- Replacing worn/damaged tie-down cords (material provided by others)
- Inspection, removal, and replacement of failed or damaged tarps (material provided by others).

The tarping practice is intended to ensure timely return of empty, usable containers to various Hanford Site locations and prevent the entrance of precipitation into full and empty containers staged in the Container Transfer Facility.

The SUBCONTRACTOR shall provide and apply a nonregulated lubricant (e.g., vegetable oil, calcium chloride, or propylene glycol) to the inside of the CONTRACTOR-supplied containers from November through February to ensure the release of plastic liners and contents from the containers during the dumping operation at ERDF.

2.3.9 Waste Shipping

Excavated contaminated material will generally be shipped to ERDF. The SUBCONTRACTOR shall supply information regarding the container identification, date of excavation, type of material, and point of origin of excavated material, all in accordance with the Subcontract documents. The CONTRACTOR will supply a waste profile that identifies the activity and isotopic makeup of the material. SUBCONTRACTOR will be required to assist CONTRACTOR in preparation, collection, and placement of shipping papers on containers. SUBCONTRACTOR shall list on the waste shipping papers, at a minimum, (1) container number, and (2) any anomalous material not listed in the contents section of the shipping form. The SUBCONTRACTOR shall be aware of the different types and proportions of materials being loaded into containers and ensure that the description of the container contents is listed on the shipping form. The CONTRACTOR will provide waste shipping services.

The SUBCONTRACTOR is responsible for ensuring that material (including containers) being shipped does not exceed over-the-road weight restrictions. Each container shall meet the shipping requirements (e.g., valid waste profile) as specified in the Subcontract documents.

The SUBCONTRACTOR shall be responsible for managing traffic and container inventory (full and empty) to maximize the turnaround time for containers and to minimize impacts to container loading and unloading.

As a minimum, the SUBCONTRACTOR shall make efforts to cycle containers within a two (2)-day (working) period, or as approved by the CONTRACTOR. Empty containers not used at the end of the work day shall be counted as part of the container availability for the following day.

2.3.10 Waste Minimization

The SUBCONTRACTOR shall handle all materials in a manner that minimizes the generation of additional waste and the occurrence of cross-contamination. The

CONTRACTOR will identify uncontaminated materials based on radiological surveys and/or chemical analysis. The SUBCONTRACTOR shall segregate uncontaminated material from contaminated material for waste minimization. This also includes, but is not limited to, laundry, tape, equipment, tools, and other miscellaneous materials/debris.

2.3.10.1 Clean Material Recycling

The SUBCONTRACTOR shall segregate and stockpile clean material for future re-use or recycling. Clean materials to be segregated and stockpiled for recycling include, but are not limited to, fence fabric, fence posts, steel, and aluminum. The segregation and stockpiling of recyclable materials is compensated under other work pay items. The SUBCONTRACTOR shall provide the labor and equipment required to separate and retrieve the material from the stockpile, package, and load the material on CONTRACTOR-provided trucks.

2.3.10.2 Clean Material Disposal

The SUBCONTRACTOR shall segregate and stockpile clean material for disposal at a Hanford debris landfill. Clean materials to be segregated and stockpiled for disposal include, but are not limited to, asphalt, wood, fence post bases, and miscellaneous concrete. These materials will require pre-job and in-process surveys to aid in verifying contamination status. SUBCONTRACTOR shall coordinate survey and handling requirements with CONTRACTOR prior to handling the material. The segregation and stockpiling of clean material for disposal is compensated under other work pay items. The SUBCONTRACTOR shall provide the labor and equipment required to load and transport the material from the stockpile to a Hanford debris landfill for disposal.

2.3.11 Personnel Protective Equipment

The SUBCONTRACTOR shall provide and maintain PPE, including anti-contamination clothing (anti-Cs), for all site personnel, as required for the execution of the work scope. All PPE shall meet current American National Standards Institute standards. The SUBCONTRACTOR PPE shall comply with the standards set forth in 29 CFR 1910.132 through 1910.138 and 29 CFR 1926.28(a) and (b), 29 CFR 1926.95 through 29 CFR 1926.96. Respiratory protection shall be administered in compliance with 29 CFR 1910.134 and 29 CFR 1926.103

SUBCONTRACTOR shall consider restraints inherent to a radiological/chemical environment when planning and executing work logistics and work processes (i.e., means and methods). SUBCONTRACTOR shall anticipate and be prepared to perform work operations using different levels of personal protection based on the SUBCONTRACTOR's means and methods and the radiological parameters identified and specific radiological/chemical conditions prior to performing work (identified on radiological work permit). Personal protection levels of D, C, and B should be anticipated as part of this scope of work.

The SUBCONTRACTOR shall provide and maintain an inventory of Anti-Cs. The SUBCONTRACTOR shall provide the SUBCONTRACTOR personnel with Anti-Cs, as

required, and provide an additional 50 sets (minimum) per month for CONTRACTOR support personnel. The SUBCONTRACTOR shall be responsible for providing and maintaining a supply of flame-resistant Anti-Cs for personnel involved in torch-cutting activities. CONTRACTOR Anti-C size requirements will be provided to the SUBCONTRACTOR during project mobilization. Clean Anti-Cs shall be stored in an orderly manner, in a secure area, free of dust intrusion and pests (e.g., spiders), and clearly segregated by size. The SUBCONTRACTOR shall identify, tag, and immediately dispose defective PPE.

The SUBCONTRACTOR is responsible for providing and maintaining respiratory protection of SUBCONTRACTOR employees for nonradioactive hazards based on the SUBCONTRACTOR's means and methods, including an inventory of clean respiratory masks.

For work performed within a radiological area that may require respiratory protection based on the potential for airborne radioactive contamination, the CONTRACTOR will provide respiratory protection. Should a combination of hazards be present with airborne radioactive contamination, the CONTRACTOR shall coordinate with the SUBCONTRACTOR's Safety Representative to determine the appropriate respiratory protection combination that the CONTRACTOR will provide.

2.4 BACKFILL

After site cleanup verification support requirements and OWNER approval have been attained, the CONTRACTOR will direct the SUBCONTRACTOR to backfill excavated areas as indicated in the project drawings. The top of backfill is defined as the same elevation of the pre-remediation adjacent surrounding grade. The SUBCONTRACTOR shall load, haul, place, and contour backfill, as specified. Backfill material shall be obtained from uncontaminated stockpiles or from local borrow areas, as identified by the CONTRACTOR. Materials collected during the stripping operation shall be placed on top of the backfill.

The SUBCONTRACTOR shall allow a minimum of one hundred thirty one (131) working days after completion of excavation of each specified contamination work area and pipeline activity before beginning backfill activities for the 100 B/C pipeline trenches and contaminated areas.

2.5 DEMOBILIZATION

2.5.1 Demobilization

The SUBCONTRACTOR shall perform site and equipment cleanup at the completion of work. This includes the immediate cleanup of temporary roads used by the SUBCONTRACTOR to transport contaminated material to the Container Transfer Facilities, if contaminated during transport. All temporary roads, work areas, and queues shall be

scarified to a minimum depth of 0.305 m (1 ft) at the end of use to support future revegetation efforts. SUBCONTRACTOR shall retain existing fencing and shall replace fencing to original state as directed by the CONTRACTOR. At the direction of the CONTRACTOR, some of the temporary roads may be left in place.

Demobilization shall include the decontamination and removal (as required) of all SUBCONTRACTOR-owned/leased equipment, tools, and facilities brought onto the site to perform this work.

2.5.2 Stabilization

At the completion of this project, some excavations may be left open over a substantial period of time during which negotiation of site status with regulatory agencies is in progress. In this case, the SUBCONTRACTOR will stabilize all sites with a minimum of 25 mm (1 in.) of uncontaminated soil or a heavy coating of soil-crusting agents/fixants. Open excavations will be barricaded in accordance with 29 CFR 1926, Part N. The SUBCONTRACTOR shall establish erosion control around open excavations.

3.0 WORK NOT INCLUDED

This scope of work does not include the following related work:

- Radiological control support/personnel monitoring
- Radiological detectors/instrumentation
- Sample technicians and sampling equipment
- Analytical services
- Supplying waste containers, tarps, and tiedowns
- Treatment of dangerous wastes
- Transporting containers from Container Transfer Facility to ERDF
- Cultural/ecological assessments or reviews.